REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-21 are pending in the present application. Claims 1-7 and 11-17 are amended, and Claims 18-21 are added by the present amendment. No new matter is added.

In the outstanding Office Action, the drawings were objected to; Claims 11 and 13-17 were rejected under 35 U.S.C. 112, second paragraph; Claims 1, 4, 7, 10, and 12 were rejected under 35 U.S.C. 103(a) as unpatentable over U.S. Patent No. 6,570,687 B2 to Araki et al. (hereinafter "Araki") in view of U.S. Patent No. 5,729,548 to Holender; Claims 2, 3, and 5 were rejected under § 103(a) as unpatentable over Araki in view of Holender, and further in view of U.S. Patent No. 6,473,214 B1 to Roberts et al.; Claims 6 and 8 were rejected under § 103(a) as unpatentable over Araki in view of Holender, and further in view of U.S. Patent No. 6,160,656 to Mossberg et al.; Claim 9 was rejected under § 103(a) as unpatentable over Araki in view of Holender, and further in view of U.S. Patent No. 6,128,115 to Shiragaki; Claims 11 and 17 were rejected under § 103(a) as unpatentable over Araki in view of Holender, and further in view of U.S. Patent No. 5,365,362 to Gnauk et al.; and Claims 13 and 16 were rejected under § 103(a) as unpatentable over Araki in view of Holender, and further in view of Roberts.

Regarding the objection to the drawings, Figures 2, 4, 5, 11(a), and 14 are amended in view of the Examiner's comments. Accordingly, Applicants respectfully request that the objection to the drawings be withdrawn.

Regarding the rejection of Claims 11 and 13-17 under § 112, second paragraph, those claims are amended in view of the Examiner's comments. Accordingly, Applicants respectfully request that the § 112, second paragraph, rejection of those claims be withdrawn.

Addressing now the rejection of all claims as unpatentable over Araki in view of Holender, as summarized above, those rejections are respectfully traversed.

Amended Claim 1 is directed to a photonic network packet routing method. The method includes:

> optically encoding destination address information attached to an IP packet using light attributes,
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> discriminating the encoded address information of the IP packet by optical correlation processing,
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> switching to an output path for the IP packet based on a result of the discriminating step, and
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> outputting the IP packet labeled with prescribed address information on the output path selected by the switching step.

Amended Claim 12 is directed to a packet router for a photonic network. The packet router includes:

> encoding means for encoding by use of light attributes including destination address information attached to an IP packet,
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> branching means for sending the IP packet having the encoded destination address information onto two paths,
>
> address processing means for subjecting one IP packet received from the branching means to optical correlation processing and outputting a switch control signal based on a result of the discrimination, and
>
> switch means for selectively outputting the packet by switching an output path of the other packet received from the branching means based on the address control signal from the address processing means.

The remaining claims depend from Claim 1 or Claim 12.

By way of background, one function of a phototonic router is to read the destination address of an IP packet and then "switch", *i.e.*, route, the packet to a port connecting to the packet's destination.[1] Recent advances have resulted in faster optical switches.[2] However,

[1] Specification, page 1, lines 28-29.
[2] Specification, page 2, lines 10-12.

the speed of conventional phototonic routers is slowed by the process of converting the optical IP packet signal to an electrical signal, such that the IP packet's address may be electrically read and supplied to a controller that routes the IP packet.[3] The present invention is provided, in part, in view of that deficiency.

In a non-limiting example, Figure 1 illustrates an embodiment of a node of the claimed phototonic network.[4] As shown, the optical processor 6a reads the address information of the optical IP packet signal and outputs a corresponding optical signal for switching control.[5] The corresponding optical signal for switching control is subsequently converted to an electrical signal, by the photodetector PD, and then supplied to the switching section 7 to prompt routing of the IP packet to the appropriate output port.[6] Since the address processing section 6 reads the address information and outputs the optical control signal without first converting the optical signal to an electrical signal, the processing time is markedly reduced.[7]

The outstanding Office Action cites Araki as teaching the claimed step of discriminating the encoded address information of the IP packet by optical processing. More particularly, the Office Action cites the destination address extraction circuit 105 of Figure 2 as teaching the discriminating step by optical processing.[8] However, the destination address extraction circuit 105 does not perform optical processing. In fact, the electrical IP packet signal 1001, which is supplied to the destination address extraction circuit 105, is not converted to an optical IP packet signal by the electro-optical converter ("E/O") 112 until all

[3] Specification, page 1, line 30 – page 2, line 9.
[4] Specification, page 4, line 36 – page 5, line1.
[5] Specification, page 6, lines 21-23.
[6] Specification, page 6, lines 23-26.
[7] Specification, page 6, lines 26-29.
[8] Office Action, 10/27/2003, page 3.

address processing is performed and the IP packet is ready for output to the optical switch 100.[9] Thus, Araki does not teach a step of discriminating by optical processing.

The Office Action further cites the encoding circuit 950 as "using light attributes" to encode address information upon the electrical IP packet signal 1001 of Figure 30.[10] Respectfully, Applicants cannot determine the cited light attributes, especially since the electrical IP packet signal 1001 of Figure 30 is described as buffered and containing bits.[11]

The Office Action also cites Holender as teaching the claimed step of optically encoding the destination address information.[12] More particularly, the Office Action cites the optical encoder of Figure 9 as teaching that step.[13] However, the optical encoding taught by Holender is not suitable for IP packet switching, because the optically encoded address information of Holender is ***not used to select to an output path*** for an IP packet. Rather, in Holender, a modulating pattern is selected for each optical IP packet signal, based on the destination address information of the IP packets, and each optical IP packet signal is then ***broadcast as part of a composite optical signal to all possible outputs*** of a parallel "switch".[14] The destination receivers simply remove their respective optical IP packets from the composite signal, *i.e.*, filter the optical IP packets having a modulating pattern corresponding to that destination receiver, and demodulate the respective optical IP packets to form electrical IP packets routed by conventional means.[15] Thus, as the optically encoded IP packet signals of Holender never prompt selection of an output path, Holender does not teach the claimed optically encoded destination address information. Applicants also note, when the method of Holender is utilized, the amount of intercode interference is increased and the number of addresses that may be managed is decreased.

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[9] Araki, Figure 2.
[10] Office Action, 10/27/2003, page 3.
[11] Araki, col. 29, line 19 – col. 30, line 7.
[12] Office Action, 10/27/2003, page 3.
[13]
[14] Holender, Abstract; col. 2, lines 43-52.
[15] Holender, Abstract; col. 2, lines 43-52.

In addition to the above remarks, Applicants respectfully note that there is no proper motivation to combine the teachings of Araki and Holender, because the proposed modification renders the teachings of Araki unsatisfactory for their intended purpose. More particularly, Araki teaches a switching network, whereby input units 101 and output units 102 are connected in order to route IP packets based on the destination addresses received by the contention resolution circuit 103.[16] As the encoding system of Holender only provides a means of filtering optical IP packet signals of a prescribed modulation, that encoding system would not permit the switching network of Araki to read those optical IP packet signals in order to determine an appropriate output unit 102. Thus, the switching network of Araki would be rendered unsatisfactory for its intended purpose by the encoding system of Holender.

New Claims 18-21 are added by the present amendment to further clarify the features of independent Claims 1 and 12. More particularly, new dependent Claims 18 and 20 (depending from Claims 1 and 12, respectively) further clarify that the light attributes of the optically encoded destination address information are wavelengths, phases, or amplitudes of light.[17] New dependent Claims 19 and 21 (depending from Claims 1 and 12, respectively) further clarify that the encoded destination address information is optically processed in time domain.[18] Applicants note that the electrical IP packet signals of Holender are transformed to optical IP packet signals in the spatial-domain.[19] Thus, new Claims 18-21 further distinguish over the proposed combination of Araki in view of Holender.

[16] Araki, col. 10, line 57 – col. 11, line18.
[17] For support, see Specification, page 7, lines 8-16; and page 9, lines 15-18.
[18] For support, note that the phase and frequency attributes of new Claims 18 and 20 are time-domain attributes.
[19] Holender, col. 11, lines 16-19.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance, and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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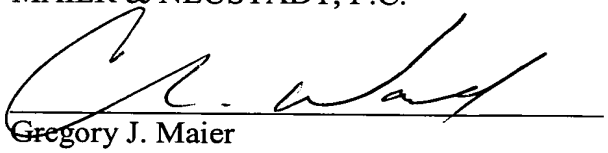

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